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User interface apparatus and broadcast receiving apparatus

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Abstract:

An user interface apparatus that receives a user operation of an electrical device and notifies the electrical device of the instruction to execute an action according to the user operation predicts at least one action, the execution of which is supposed to be desired by the user, provides a user interface for having the user designate one action out of the at least one action, and receives a designation by the user. When receiving the user designation, the user interface apparatus notifies the electrical device of the instruction to execute the action that has been designated by the user.

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Claims:

1. A user interface apparatus that receives a user operation of an electrical device and notifies the electrical device of an execution instruction relating to an action according to the user operation, comprising: predicting means for predicting at least one action, an execution of which is supposed to be desired by a user; user interface means for providing a user interface in order to have the user designate one out of the actions that have been predicted by the predicting means, and for receiving a designation of an action by the user; and notifying means for notifying the electrical device of an execution instruction relating to an action according to the user action designation that has been received by the user interface means.

2. The user interface apparatus according to Claim 1, wherein the user interface means automatically provides the user interface without being instructed by the user.

3. The user interface apparatus according to Claim 2, further comprising user information storage means for storing user information that is peculiar to the user, wherein the predicting means predicts the actions according to the user information after a condition of the electrical device becomes a predetermined condition.

4. The user interface apparatus according to Claim 3, wherein the user information is taste information on tastes of the user, and the predicting means predicts actions that meet the tastes of the user according to the taste information.

5. The user interface apparatus according to Claim 3, wherein the user information is behavioral information on habitual behavior of the user, and the predicting means predicts actions that are necessary to keep the habitual behavior of the user according to the behavioral information.

6. The user interface apparatus according to Claim 3, wherein the user interface means provides the user interface by displaying at least one image in order to have the user designate one out of the

actions that have been predicted by the predicting means, wherein the image displayed in the user interface includes an image that shows a reason why the action has been predicted.

7. The user interface apparatus according to Claim 3, wherein the electrical device is a broadcast receiving apparatus that displays an image of a received program on a monitor, the user information storage means stores user information that is peculiar to a user of the broadcast receiving apparatus, and the user interface means provides the user interface by displaying an image on the monitor for having the user designate one out of the actions that have been predicted by the predicting means.

8. The user interface apparatus according to Claim 7, further comprising: program table storage means for storing a program table including information on a plurality of programs; and user information receiving means for receiving input of the user information by the user and for storing the user information in the user information storage means, wherein the user information is program taste information that shows tastes of the user relating to programs, and the user interface means refers to the program table and the program taste information, detects a program that meets the tastes of the user other than a program that the broadcast receiving apparatus is presently receiving, and displays an image on the monitor for having the user designate an execution of an action of switching a received object of the broadcast receiving apparatus to the detected program.

9. The user interface apparatus according to Claim 7, further comprising program table storage means for storing a program table including information on a plurality of programs, wherein the user information is bedtime information that shows a bedtime of the user, and the user interface means refers to the program table and the bedtime information, compares the bedtime with a time when a program that the broadcast receiving apparatus is presently receiving ends, and displays an image on the monitor for having the user designate an execution of an action of recording the program when the program ends after the bedtime.

10. The user interface apparatus according to Claim 2, further comprising: general operation receiving means for receiving a user operation of the electrical device other than the user action designation that the user interface means receives; general notifying means for notifying the electrical device of an execution instruction according to the user operation that has been received by the general operation receiving means; and holding means for holding execution instruction information on the execution instruction according to the user operation that has been received by the general operation receiving means, wherein the predicting means predicts actions according to the execution instruction information that is held by the holding means.

11. The user interface apparatus according to Claim 10, wherein the predicting means predicts actions when an execution

completion of an action of the electrical device is detected, and the user interface means provides the user interface when the predicting means has predicted the actions.

12. The user interface apparatus according to Claim 11, wherein the electrical device is a broadcast program recording and replaying apparatus that records a plurality of broadcast programs, replays a recorded broadcast program, and displays the replayed broadcast program on the monitor, when it is detected that one of a series of broadcast programs has been replayed by the broadcast program recording and replaying apparatus, the predicting means predicts an action of replaying a next broadcast program in the series of broadcast programs as one of the predicted actions, and the user interface means provides the user interface by displaying at least one image for having the user designate one out of the actions that have been predicted by the predicting means.

13. The user interface apparatus according to Claim 11, wherein the predicting means includes a priority storage unit for storing priority information in which priorities are set for actions of the electrical device, the predicting means predicts actions, a number of which is at least one and no greater than a predetermined number, by referring to the priority information, the general operation receiving means has an operation button, which is used by the user, displays an image for assisting a user operation, and receives a user operation corresponding to the image via the operation button, the user interface means has a designation button, which is different from the operation button and is used by the user, and receives the user action designation via the designation button, and when an execution of the action according to the user action designation that has been received by the user interface means needs setting information according to a user operation, the notifying means creates an execution instruction that includes the setting information by referring to the execution instruction information that is held by the holding means, and notifies the electrical device of the created execution instruction.

14. The user interface apparatus according to Claim 10, wherein the predicting means predicts actions when completions of all user operations that are necessary to have the electrical device execute one action are detected.

15. The user interface apparatus according to Claim 10, wherein when an execution of the action according to the user action designation that has been received by the user interface means needs setting information according to a user operation, the notifying means creates an execution instruction that includes the setting information by referring to the execution instruction information that is held by the holding means, and notifies the electrical device of the created execution instruction.

16. The user interface apparatus according to Claim 10, wherein the predicting means includes a priority storage unit for storing priority information in which a priority is set for an action of the

electrical device, and the predicting means predicts actions, a number of which is at least one and no greater than a predetermined number, by referring to the priority information.

17. The user interface apparatus according to Claim 2, further comprising general operation receiving means for receiving a user operation of the electrical device other than the user action designation that the user interface receives, wherein the general operation receiving means has an operation button, which is used by the user, displays an image for assisting a user operation, and receives a user operation corresponding to the image via the operation button, and the user interface means has a designation button, which is different from the operation button and is used by the user, and receives the user action designation via the designation button.

18. The user interface apparatus according to Claim 2, wherein the electrical device is a broadcast receiving apparatus that displays an image of a received program on a monitor, the electrical device includes: receiving means for receiving a program on a channel; and condition detection means for detecting a condition where the receiving means had received a program on a first channel for at least a first period, the first channel was switched to a second channel according to a user operation, and a second period has elapsed, the predicting means predicts a switching action to the first channel as one action, an execution of which is supposed to be desired by the user when the condition is detected by the condition detection means, the user interface means displays an image on a monitor for having the user designate an execution of the switching action to the first channel that has been predicted by the predicting means, and receives the user action designation, and when notified of the switching action to the first channel by the notifying means, the broadcast receiving apparatus controls the receiving means and has the receiving means receive the program on the first channel.

19. The user interface apparatus according to Claim 1, further comprising: evaluation value storage means for storing evaluation values that each correspond to different actions of the electrical device; semantic relation information storage means for storing semantic relation information on semantic relations between the actions of the electrical device and a plurality of keywords; keyword receiving means for receiving a designation of a keyword by the user; initializing means for initializing the evaluation values that are stored in the evaluation value storage means and setting each of the evaluation values at a predetermined value; and evaluation value increasing means for referring to the semantic relation information and for increasing an evaluation value corresponding to an action that has a semantic relation to the keyword, the designation of which has been received by the keyword receiving means, wherein when the keyword receiving means receives the keyword designation, the predicting means predicts actions by specifying a predetermined number of actions in decreasing order of evaluation value according to the evaluation

values that are stored in the evaluation value storage means, and the user interface means provides a user interface for having the user designate one action out of the predetermined number of actions, which have been predicted by the predicting means.

20. The user interface apparatus according to Claim 19, wherein the keyword receiving means receives the designation of the keyword after creating a dedicated menu for having the user designate an action of the electrical device that includes a plurality of keywords having semantic relations to at least one of the actions of the electrical device by referring to the semantic relation information and displaying the dedicated menu, and the user interface means provides the user interface by displaying an image for having the user designate one out of the predetermined number of actions.

21. The user interface apparatus according to Claim 20, further comprising: general operation receiving means for receiving a user operation of the electrical device other than the keyword designation that the keyword receiving means receives and the user action designation that the user interface means receives; and general notifying means for notifying the electrical device of an execution instruction according to the user operation that has been received by the general operation receiving means, wherein the general operation receiving means has an operation button, which is used by the user, displays an image for assisting a user operation, and receives a user operation corresponding to the image via the operation button, the user interface means has a designation button, which is different from the operation button and is used by the user, the keyword receiving means receives the user keyword designation by the user via the designation button, and the user interface means receives the user action designation via the designation button.

22. A broadcast receiving apparatus that displays an image of a received program on a monitor, comprising: execute control means for receiving an instruction, for controlling elements in the broadcast receiving apparatus in response to the instruction to have an action be executed; user information storage means for storing user information that is peculiar to a user of the broadcast receiving apparatus; user interface means for displaying at least one image for having the user designate an action out of at least one action, an execution of which is supposed to be desired by the user according to the user information that is stored in the user information storage means, and for receiving a designation of the action by the user after the broadcast receiving apparatus is in a predetermined condition; and notifying means for notifying the execute control means of an execution instruction relating to an action according to the user action designation that has been received by the user interface means.

23. The broadcast receiving apparatus according to Claim 22, further comprising program table storage means for storing a program table including information on a plurality of programs,

wherein the user information is program taste information that shows tastes of the user relating to programs, and the user interface means refers to the program table and the program taste information, detects a program that meets the tastes of the user other than a program that the broadcast receiving apparatus is receiving, and displays an image on the monitor for having the user designate an execution of an action of switching a received object of the broadcast receiving apparatus to the detected program.

24. The broadcast receiving apparatus according to Claim 23, further comprising user information receiving means for receiving the user information input by the user and for storing the user information in the user information storage means.

25. The broadcast receiving apparatus according to Claim 23, further comprising received program information obtaining means for obtaining information on the received program by referring to the program table, and for storing the obtained information in the user information storage means as the program taste information.

26. The broadcast receiving apparatus according to Claim 22, further comprising program table storage means for storing a program table including information on a plurality of programs, wherein the user information is bedtime information that shows a bedtime of the user, and the user interface means refers to the program table and the bedtime information, compares the bedtime with a time when a presently received program ends, and displays an image on the monitor for having the user designate an execution of an action of recording the presently received program when the program ends after the bedtime.

27. The broadcast receiving apparatus according to Claim 26, further comprising temporary storage means for temporarily storing data on the received program, wherein when notified of an execution instruction for the action of recording the received program by the notifying means, the execute control means has recording means in the broadcast receiving apparatus record the received program from a part that has been received before a notification of the execute instruction for the action of recording using the data stored in the temporary storage means.

28. The broadcast receiving apparatus according to Claim 22, wherein an image that the user interface means displays includes an image that shows a reason why an action is predicted.

29. A broadcast receiving apparatus that displays a received image on a monitor, comprising: receiving means for receiving a program on a channel; condition detection means for detecting a condition in which the receiving means had received a program on a first channel for at least a first period, the first channel was switched according to a user operation, and a second period has elapsed; user interface means for displaying an image on the monitor in order to have a user designate an execution of a switching action to

the first channel when the condition detection means detects the condition, and for receiving a designation by the user; and reception control means for controlling the receiving means and for having the receiving means receive the program on the first channel when the user interface means receives the designation by the user.

30. The broadcast receiving apparatus according to Claim 29, wherein the image that the user interface means displays includes an image showing that the second period has elapsed since the first channel was switched.

31. A storage medium that records a program for having a computer execute a user interface process for receiving a user operation of an electrical device and for notifying the electrical device of an execution instruction of an action according to the user operation, the user interface process, comprising: a prediction step for predicting at least one action, an execution of which is supposed to be desired by a user; a user interface step for providing a user interface in order to have the user designate one out of the actions that have been predicted at the prediction step and for receiving a designation of an action by the user; and a notification step for notifying the electrical device of an execution instruction relating to an action according to the user action designation that has been received at the user interface step.

32. A storage medium that records a program for having a computer execute a broadcast reception process for displaying an image of a received program on a monitor, the broadcast reception process, comprising: a user interface step for displaying an image in order to have a user designate an action out of at least one action, an execution of which is supposed to be desired by the user according to user information that is peculiar to the user after the computer is in a predetermined condition, and for receiving a designation of an action by the user; and an execution step for executing an action according to the user action designation that has been received at the user interface step.

33. A storage medium that records a program for having a computer execute a broadcast reception process for displaying a received image of a received program on a monitor, the broadcast reception process, comprising: a reception step for receiving a program on a channel; a condition detection step for detecting a condition in which a program on a first channel had been received for at least a first period, the first channel was switched according to a user operation, and a second period has elapsed; a user interface step for displaying an image on the monitor in order to have a user designate an execution of a switching action to the first channel when the condition has been detected at the condition detection step, and for receiving a designation by the user; and a reception switch step for switching a received channel so that the program on the first channel is received when the designation by the user has been received at the user interface step.

Description:

*[0413] (12) Even when a keyword or function item on the primary side has a semantic relation to that on the secondary side, the keyword or function item on the secondary side does not always have a semantic relation to that on the primary side in the semantic relation information 3530 in the second embodiment. It is possible that when a keyword or function item on the primary side has a semantic relation to that on the secondary side, the keyword or function item on the secondary side always has a semantic relation to that on the primary side.

In addition, while the weights are all "1" in the second embodiment, a weight is not limited to "1". In this case, each of the outputs V[0], V[1], and the like in Fig. 23 is weighted and input according to the weight.

(13) The display keyword determination by the auxiliary menu controller 3418 may not be performed according to the processing shown in the flowchart in Fig. 24. For instance, the operations at steps S502 and S507 may be excluded from the processing.

The auxiliary menu controller 3418 may not update keyword button images when the user selects a keyword and may update keyword button images only when the button image "display other words" is selected. In other words, the operation at step S403 after the operation at step S409 may be skipped and the operation at step S404 may be performed just after the operation at step S409 in the flowchart in Fig. 22.

(14) While a button image is displayed on the monitor in the fourth embodiment (refer to Fig. 32), a plurality of button images may be displayed when a plurality of programs are recommended. In addition, it is possible to display a button image for displaying a recommendable program and another button image for recording the recommendable program. In this case, when the user selects a button image, the apparatus performs according to the content of the selected button image.

(15) While the taste genre 6401 shows 10 or less user favorite program genres and the favorite program 6402 shows 10 or less user favorite programs in the fourth embodiment, the number of the maximum number is not limited to "10". In addition, priorities may be given to the user favorite program genres and user favorite programs. For instance, when priorities are given to the user favorite program genres, when the highest priority is given to sport, the second highest priority is given to news, and the third highest priority is given to movie, and when a plurality of recommendable programs are detected according to the user favorite program genres, it is possible to select a predetermined number of programs in order of decreasing priority of genre and to display the selected programs as the recommend display.

(16) A button image for the recommend display that has been explained in the third and fourth embodiments may be dismissed by the user using the remote controller. The button image "return to movie "XX" (one minute has elapsed)" may be dismissed when the user switches channels to watch the movie "XX" with the remote controller.

(17) The watching determination of one program is detected when the user has been watching a program on the same channel for at least 10 minutes in the third and fourth embodiments, the period of time is not limited to 10 minutes. It is possible to detect the watching determination of one program by judging the same program has been watched for at least 10 minutes on referring to the program table.

(18) While a program that is to be broadcasted by the time a presently watched program ends is recommended according to the program recommendation function in the fourth embodiment, the programs that are to be broadcasted within a few minutes of the present time may be recommended every few minutes.

(19) While the reason that is included in the content of the button image for a recommend display such as ("YZ" appearing)" is a genre or a player name according to the program recommendation function in the fourth embodiment, another reason such as the fact that the program has been watched or is watched every week may be included. In addition, the reason may be shown by a character string or a symbol that represents the reason.

(20) While the user information is not divided for a plurality of users in the fourth embodiment, the user information may be divided for a plurality of users. For instance, sets of a user name and the corresponding user information may be input, and a user name may be attached to a recommend display such as a recommendable program. In addition, each of the plurality of users may has a different remote controller. In this case, it may be judged that which remote controller is now operating a digital broadcast receiving apparatus, and a recommend display related only to the user of the remote controller may appear according to the judgement.

(21) While a recommend display appears after the watching determination when a presently watched program ends after the usual bedtime according to the bedtime responding function in the fourth embodiment, the timing of the recommend display is not limited to this example. The recommend display may appear when the bedtime draws near. In addition, the recommend display may appear when a program is scheduled to end at least 30 minutes after the bedtime.

(22) It is possible to distribute a computer program that has the processing procedure of the execute control function and the user interface control function by the controller 1110 in the first

embodiment (the operations in the flowcharts in Figs. 12 and 14, and the like), the processing procedure of the auxiliary menu control by the auxiliary menu controller 3418 in the second embodiment (the operations in the flowcharts Figs. 22 and 24, and the like), or the processing procedure of the recommend display control in the third or fourth embodiment (the operations in the flowcharts Figs. 27,.31, and 33, and the like) be executed by a general purpose computer or an electrical appliance equipped with a program execution function via a variety of communication channels, or to record the computer program on a recording medium and distribute the computer program.

Such a recording medium includes an IC card, an optical disk, a flexible disk, a read only memory (ROM), and the like. Generally speaking, when used, the distributed computer program is installed in an electrical appliance, a personal computer, and the like which each have a program execution function. Such an electrical appliance and a personal computer execute the computer program to realize the functions related to the user interface shown in the first to fourth embodiments.

Although the present invention has been fully described by way of examples with reference to the accompanying drawings, it is to be noted that various changes and modifications will be apparent to those skilled in the art. Therefore, unless such changes and modifications depart from the scope of the present invention, they should by construed as being included therein.

<- Previous Patent (Method and apparatus...) | Next Patent (Channel selection ap...) ->